

Full Length Article**Number and Numeracy in Aari**Fekede Menuta¹

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Abstract

Number here refers to a grammatical category as it is reflected in nouns, adjective and verbs. On the other hand, numeracy refers to a lexical entity that helps to count as in cardinal numerals, and to order as in ordinal numerals. The objective of this article was to describe number and numeracy in Aari thereby shows how both number and numeral are largely associated with *human body* and the *participants* in communication (the persons) in a given interaction. The research followed structuralism approach and qualitative methodology. Linguistic data were collected from five key informants who are native speakers of the language. The data were described as they were produced, however, by reducing them to the phonemic level. IPA and Leipzig's morpheme-by-morpheme glossing rules were used for transcription and glossing, respectively. The finding showed that nouns and adjectives uniformly use {-na} to show plural, and the singular is not marked. This morpheme is not associated with body or person. On the other hand, numbers in verbs are marked with person agreement morphemes: the first person singular is {-it-}², and the plural is {-ot-}; the second person singular is {-aj-}, and the plural is {-at-}; and the third person singular is {-ø-} which means not marked, and the plural is {-ek-}. Numerals in Aari are quite unique; the numbers 1-7 and 10 are basic, and are not strictly associated with body. Numerals 8 and 9 are compound that are derived by mathematical computation, that is, by subtracting two and one from 10, respectively. Numerals from 20 and above are based on human body. For instance, 20 is boonda literally 'one full person', and 30 is *e-wolexbab its-ke afe-tema* [full- one. person eat- and mouth-ten] which again literally means 'a full person and ten mouths ready to eat'. Ordinal numeral basically operate only for numbers 1-10, and it is shown with {-si}. The complex numeral systems are recently modified for pedagogical reason. This may endanger the pre-existing counting system as children will have the access only for the modified forms.

Key Words: *Aari/ Computation/Number/ Numeracy/ Omotic/*

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² Note that the morphemes indicated with morpheme boundary (-) before and after does not imply infix, it rather shows that the morpheme is preceded by verb root and followed by other agreement affixes. In fact, the concept of infix applies only when an affix is inserted penetrating the root as in 2.1.1 9(ii), possessive pronouns.

1. Introduction

1.1. Background

Aari sometimes spelt as Ari refers the people and place where East Omotic language speakers live in the South Omo Zone of the Southern Nation Nationalities and Peoples Regional State (SNNPRS). The South Omo Zone borders with Bench Maji Zone in the South East, Kafa and Gamo Goffa Zones, Konta special district and Basketo Special district in the South; Derashe special district in the North West, Konso district, which was called special district but now became part of Segen Hizboch Zone, and Oromiya region in the West and Kenya in the North. The administrative town of South Omo is Jinka, situated at about 525 km from Hawassa, the capital city of the SNNPRS, and 750 km from Addis Ababa, the capital city of Ethiopia.

South Omo Zone administratively, and of course linguistically, is divided into eight districts; namely, Male, Salamago, Benna-Ts'emay, Hammer, Nyangatom, Dassench, North Aari and South Aari. The administrative town of each district is Lemo-Gento, Hanna, Qey-Afer, Dimeka, Kangaton, Omorate, Gallia and Gather, respectively.

Aari language speakers are found in two districts of the Zone- in North Aaria and South Aari. The people of Aari are also organized into two main clans: the Indi or Sozma and Ashenda or Zera. Though currently the people are ruled by government assigned district authorities, there are nine traditional leaders who are chiefs of the villages they live in. According to 2007 census, the population of Aari is 280, 187; of which, 212,389 and 67,798 live in the South and the North Aari districts, respectively. The Aari people are farmers producing maize, sorghum, teff, Cardin, coffee, and root crops, such as ensete (*Ensete Ventricosum*) out which they prepare *Waashi*, their staple food. The people of Aari are polygamous whereby a man can marry any number of women as far as he has resources that sustain their lives. The marriage has to be arranged between distant kinships. Though all the tribes in Aari may intermarry, people from low classes cannot marry from the high classes. The people are mainly Christian and Islam. There are also some traditional religion followers.

The language of Aari is called *Aaraf* 'the mouth of Aari' by the speakers. The language is introduced into school system in the lower primary (1-4), and is used to broadcast community radio and TV programs for a few hours a day. Most of the Aari people are bilinguals of Basketo, Dime, Gofa, Konso, and Wolayta. Aari has four different dialect clusters; namely, Gayil, Sido, Baaka and Wubamer. Gayil has two sub-varieties: Bargid and Ub; and Sido has three sub-varieties: Shangama, Layda and Biyo (cf. Fekede, 2011).

The people of North and South Aari are less intelligible compared to their intelligibility with different dialects within their respective districts. Some dialects, such as Wubamer share the features of both North and South Aari varieties; hence, are intelligible to both the north and south Aari people. The intelligibility level becomes less among the Aari people living in areas where other Omotic languages are in contact. Languages in contact with Aari are Basketo and *Ats'i* which are spoken within and outside Aari; Male, Goffa, *Oyida*, Dime, *Mursi*, *Body* and *Benna* which are spoken outside Aari but are in contact with Aari.

The classification of Omotic languages from which Aari branches out from is shown below:

Proto- Omotic:

West Omotic: Maji

Kafa-Gimojan³

East Omotic: Aroid: Hamer-Banna

Dime

Aari: Bakka, Shengama, Laydo, Sido,
Seyki, Mura, Ubamer, Zeddo, Gayl

Adapted from (Ayyalew, 1995; Fekede, 2011)

For the sake of consistency in presentation and exclude dialect variations, which in fact affect both form and meaning, the present study is based on the Sido variety of South Aari. It has been chosen because it is relatively shared among wider villages of Aari speakers, and is intelligible to most of the Aari dialects. The lexical comparison by (Fekede, 2011) which is based on 275 lexical items shows that Sido is highly shared with Baaka (94.9%) and Wuba (84.3%), but is less shared with Gayil (50.5%).

1.2. Statement of the problem

The number and numerals system of Aari have been partly discussed from comparative perspective by Fekede (2011). He found that there is difference in number system between Gayil and Sido. According to Fekede (2011), Gayil marks plural with {-nakes} whereas the Sido variety with {-na}. Singular is not marked in both varieties. The counting system conceptually is similar in the two dialects though there are difference in the morphemes and the shapes of some numerals. A different scenario is that the counting system has been changed since 2016 by simplifying it for a pedagogical reason. The introduction of the language into the school system also required the introduction of mathematical computation system, which has not been looked into in the previous studies. This article, therefore, attempts to provide comprehensive account of the number and numeracy system, the modifications made since 2016 in the counting system, and the ways mathematical computations are made in the language to fill into the existing gap.

1.3. Objective

The aim of the study is to describe the number system and numeracy in Aari. It specifically aims to: describe the way number is expressed in nouns, adjectives, pronouns and verbs; the way numeracy is conceptualized and computed.

³ Gimojan may currently is best represented by BenoYem (Benchnoon and Yemsa)

1.4 Significance

The study can help the native speakers in preparing teaching materials as the language is already introduced into school system; it can help for comparative study of Omotic languages in particular and Afro-asiatic in general; and it can contribute for linguistic study as a reference and /or typological study.

2. Review of Related Literatures

2.1. Previous Studies

There are a few linguistic works in Aari, in fact not specific to Sido variety. Tsuge (2006) offers 417 word lists of Gayil dialect of Aari. He claims that most dialects of Aari share 85% of their vocabulary one another, but Gayil shares with other varieties only between 67.5%~79.5%. Fekede (2011) who compared 275 lexical items, however, reduces the shared vocabulary to the range between 44.7%-62.5%.

Tsuge (2005) discusses modality and aspect, which is not distinguished from tense in the study. He lists *{-maj-}*, *{aj}* or *{-ki}* as negative markers in Aari. The morpheme *{-maj-}* is preceded by a verb root and followed by the copula *{-ee}*; hence, *{-majee}*. The morpheme *faal* 'be able,' a loan from Amharic, expresses possibility. The morpheme *{-er}* shows an 'affirmative' action in the future. It often follows the future tense markers *{-t}*, *{-st}* in the plural forms. He considers *{-(s)t}* and *{-er}* aspect and modality markers, respectively. He lists *{-s(is)}*, *{-ar}/{-er}*, *{-im}*, and *{-a(a)ro}* as causative, passive, reflexive and 'iterative action markers, respectively. The morpheme *{-dakki}* functions as negative copula or existential verb. As to Tsuge (2005), it is a combination of *{da-}* and *{-ki}*, existential and negative markers, respectively. This morpheme, *{dakki}*, can occur as *dakkidajk*, where *{-dajk}* has the meaning 'because,' and as *dakka(a)b*, 'has not' / 'without' as in:

- a) *afa dakkaab*
mouth has.not 'dumb'
- b) *k'aami dakkab*
ear has.not 'deaf'
- c) *aaḥi dakkaab*
eye has.not 'blind'

I consider the morpheme *dakkaab* as a sequences of two morphemes: *{dakk-}* 'exist'; or has', and *{-aab}* 'not'.

Daniel (1993) reviews inflectional and derivational affixes, and then describes the complements of verbs in Aari using generative approach. He characterizes Aari nouns as ending with vowels *-i* or *a*. Though this is true for most nouns, Fekede (2011) provides counter evidence showing that nouns may end with consonant across the dialects of Aari.

According to Daniel (1993), derivational affixes *{-mi}* and *{-inti}* show verbal and gerundive noun, respectively. He distinguished *{-m}*, *{-t(a)}* and *{-o}* as morphological case markers of accusative, genitive and vocative, respectively. Nominative case is considered to be syntactic, not morphological. Fekede (2011) shows

that nominative is both morphological, expressed with {-a}, and syntactic-expressed by syntactic position.

Daniel (1993) distinguishes gender markers prefixed and suffixed to a noun. The prefixes that show masculine and feminine gender is {aŋ-} and {ma-}, respectively. The suffixes {-si} or {-i} and {-t} or {-a} show masculine and feminine, respectively. Fekede (2011) argues, and provides evidences that the morphemes {-i} and {-a} mark gender in a few, but not in all nouns.

Daniel (1993) distinguishes {-a} as plural marker. Fekede (2011) dismisses this showing that both singular and plural nouns can end with -a. The latter shows that a singular nouns is not marked for number, but the plural is shown with {-na} in Sido and with {-nakes}, also shortened as {-nkes}, in the northern Aari dialects, such as Gayil.

Fekede (2011) provides a comparative grammatical description of a South and North Aari dialects. He provides the phonological description, nominal and verbal morphology, morphology of adjectives, and a sketchy description of its syntax. To make readers acquainted with the sounds of Aari which will be used in the transcription of the data, we have provided the phonemic chart of Aari adapted from Fekede (2011, p.15):

Table-1: Consonant Phonemes of Aari

	Bilabial		Alveolar		Palatal		Velar		Uvular	Glottal
Stops	p	b	t	d			k	g		ʔ
Implosives		ɓ		ɗ						
Ejectives	p'									
Fricatives	f		s	z	ʃ	ʒ		χ ⁴		h
Affricates			ts		tʃ					
Ejective-affricates			ts'		tʃ'					
Nasals		m		n		ɲ				
Lateral				l						
Trill				r						
Glides		w				j				

⁴ It is uvular voiceless fricative sound. Tsuge (2006:94) uses the symbol /h/ for it though the sound does not appear in his word lists. Ford (1985) describes this sound as voiceless uvular /q/ with two variants: pharyngeal fricative [ħ] and glottal implosive [q]. Tsuge (2006) representation of the sound cannot be accepted as the sound is not found in his word list, and no minimal contrast or distribution is provided. Ford (1985) explanation is not plausible since interpreting the same sound as voiceless [ħ] and voice [q] with different air mechanism, egressive and ingressive, respectively seems implausible. What is more, Fekede (2011) found only bilabial and alveolar, but not velar implosives as shown in the phonemic chart.

The language has six vowels which contrast in length. These are: i (ii), u (uu), e (ee), o(oo), ε (εε) and a (aa).

3. Methodology

The methodology is qualitative description following structuralism approach. The data source for this study comes from my previous study conducted from 2010-2011, and new data collected during 2016/2017 from Aari native speakers, Birhanu Beyeko and Manahil Tilahun, who were studying linguistics for the masters of Arts in Linguistics and Communication at Hawassa University, Ethiopia. The data were collected with linguistic questionnaire which was prepared in English. Data elicitation, however, was made with a contact language Amharic, the language of wider communication and official language of the Federal government of Ethiopia. The Key informants were bilinguals of Aari and Amharic. The collected data were transcribed phonemically and glossed following Leipzig (2015) morpheme-by-morpheme glossing rule. The phonemically transcribed data were analyzed largely based on structuralism approach or theory.

4. Presentation of Result

4.1 Number

Number is grammatical category used to show singular, plural and dual. Most languages distinguish singular and plural only. There are languages which have three ways number distinctions: singular, plural and dual. Other concepts related numbers are: *singulative* which singles out an individual or entity as in Highland East Cushitic languages and collective *plural* as in Amharic *inə-t'ot'a* (CPL-monkey 'monkey and others') and Gurage *nə-g^wəntfə* (CPL-hyena 'hyena and others').

4.1.1. Number in pronouns

Pronouns in Aari distinguish singular and plural in first, second and third person. The distinction is made in subject and object pronouns. Verbs also show number difference with pronominal affixes attached as a subject or object agreement markers. Demonstrative pronouns distinguish singular and plural as well. The number system in different types of pronouns, nouns, verbs and adjectives is discussed below.

i) Number in subject pronouns

Table-2: Number in Subject Pronouns

Person	SG	PL
1	it-a	wo-ta
2	aan-a	jε-ta
3M	n-o-o	kε-ta
3F	n-a-a	kε-ta

The person markers are completely different in first and second person. First person is {it-} in singular and {wo-} in plural, and second person is {aan-} in singular and {jɛ-} in plural. Person marker in third person singular is {n-} with masculine marker {-o-} and feminine marker {-a-}, each of which followed by case marker, attached to it, and it is {kɛ-} in the plural. Feminine, is thus marked only in third person singular, which is neutralized in the plural form of the same person. The vowel {-a} in the pronouns shows nominative case; note that it is raised to [-o] in 3M.SG in harmony with gender marker. When we consider number marking, the focus of this study, the singular is not marked; hence, it is zero {-∅}. The plural is marked with {-ta} uniformly, and the last vowel of the plural morpheme at the same time marks nominative. One may like to represent the plural with {-t-} and {-a} as nominative marker. Considering the plural as {-ta}; however, seems more plausible in comparative term as this morpheme is used as plural marker in other Omotic languages, such as Konta (Fekede, 2015, p.56).

ii) Number in possessive pronouns

Number in possessive pronouns is marked by the same pronominal affixes used for object pronouns except that an additional possessive marking affix {-te} or {-ta} is suffixed. The number system in possessive pronouns is shown in Table-3:

Table-3: Number in Possessive Pronouns

Person	SG	PL
1	is-ta	won-te
2	an-te	jɛ-te
3M	ki-te	kɛ-te
3F	ko-te	kɛ-te

The possessive pronoun behaves partly like subject pronouns and partly like object pronouns formally. First person possessive singular *ista* is similar to first person singular subject pronoun *ita* except that the possessive form infixed -s-. Similarly, First person possessive plural *wonte* is similar to the first person plural subject pronoun *wota* except that the former again in-fixed -n- and has changed its terminal vowel from -a to -e. The third person possessive forms are exactly similar to object pronouns except that the former affix the possessive marking morpheme {-te}.

iii) Number in demonstrative pronouns

Aari distinguishes two distance references relative to the location of the speaker, that is, close and far references as shown below:

Table-4: Number in Demonstrative Pronouns

Reference	SG	PL
'close'	kona	kona
'far'	keena	keena-kɛs

In close reference, singular is distinguished from plural by vowel length short -o- of singular *kona* becomes long -oo- in the plural. In the far reference, the singular is zero { \emptyset }, but the plural is shown with {-kəs}.

iv) Number in isolative, inclusive and exclusive pronouns

Selective pronouns single out an individual person or item from many others persons or things. Non-selective pronoun expresses the inclusion of everyone in a group where as exclusive pronoun expresses the exclusion of everyone from a group. Since inclusion and exclusion is about singling out or adding, it is concerned with number system as shown in Table-5:

Table-5: Number in Isolative, Inclusive and Exclusive Pronouns

Person	selective (singled out)	Non-selective (inclusive)	Exclusive (omission of all)
1	<i>woləxa-wont</i> one-us 'one of us'	<i>wota- muudena</i> we -all 'all of us'	<i>aa-j-wo- tere</i> [<i>aa-bere</i>] NEG-1PL-FOC 'none of us'
2	<i>woləxa-jent</i> one-you 'one of you'	<i>jeta- muudena</i> you-all 'all of you'	<i>aa-j-jen-tere</i> NEG-2PL-FOC 'none of you'
3	<i>woləxa-ket</i> one-them 'one of them'	<i>keta- muudena</i> they-all 'all of them'	<i>aa-j-ket-tere</i> NEG-3PL-FOC 'none of them'

We observe from the examples that the semantics of isolating and including is made possible through lexical entities *woləxa* 'one' and *muudena* 'all', respectively. In both the isolative and inclusive pronouns, the forms are basically plural forms, yet they differ in two perspectives. Formally, the isolative pronouns assume object forms and the inclusive pronouns take the subject forms. Syntactically, isolative pronouns follow the singling out noun *woləxa* 'one' whereas the inclusive pronouns precede the inclusive form *muudena* 'all'. In exclusive pronouns, the plural forms of the pronouns are {-wo-} 'us', {-jen-} 'you (ACC), and {-ket-} 'them'. It is worth to note again that the exclusive forms differ formally with isolative forms though syntactically both are in accusative form. In syntactic structure, the exclusive forms are enclosed unlike the suffixes and prefixes in the isolative and inclusive forms, respectively.

4.1.2. Number in verb agreement pronoun

Verbs in Aari agree with their subject and object. The agreement is marked by the verb through inflectional affix. The affixes attached to the verb can show both the number of the subject and object noun or pronoun.

i) *Number in object agreement pronouns of verbs*

Object agreement pronouns of verbs in Aari are prefixed to the verb. The prefixes seem to be parts of subject pronouns. Below in Table-8 are the object agreement pronouns:

Table-6: Number in Verb Agreement Object Pronouns

Person	SG	PL
1	i-	wo-
2	a-	jɛ-
3M	ki-	kɛ-
3F	ko-	kɛ-

The object pronouns are dependent morphemes, and occur with verbs as an agreement marker. The forms are partly similar, with some reductions, to subject pronouns except in third person singular where the third person marker of subject pronoun {n-} changes to {-k-} in object pronoun. What is more, the gender markers changes where {-o} of masculine marker changes to {-i}; and {a-} of feminine marker becomes {o-} which marked masculine in subject pronoun. This implies that the consonants and vowels of person and gender markers should be used together than in isolation both in subject and object pronouns to avoid semantic confusion. The examples below show the forms of object pronouns in sentences:

	SG	PL
1	<i>noo i-n-keze</i> he 1SG.O-ACC-tell.PST 'he told me'	<i>noo wo-n-keze</i> he 1PL.O-ACC-tell.PST 'he told us'
2	<i>keta a-n-keze</i> they-2SG-ACC- tell.PST 'They told you'	<i>ite jɛ-n-kezite</i> I 2PL-ACC tell.PST 'I told you'
3M	<i>keta ki-m-keze</i> they-3SMO-ACC-told 'they told him'	<i>naa ke-n-keze</i> she 3PL.O-ACC- tell.PST 'she told them'
3F	<i>wota ko-n-keze</i> we 3SFO-ACC-told 'we told her'	<i>wota ke-n-keze</i> we 3PL.O-ACC- tell.PST 'we told them'

ii) *Number in subject agreement pronouns of verbs*

Table-7: Number in Verb Agreement Subject Pronouns

Person	SG	PL
1	-it-	-ot-
2	-aj-	-ɛt-
3M	-∅-	-ɛk-
3F	-∅-	-ɛk-

Example sentences demonstrating the verb agreement subject pronouns are given below:

	SG	PL
1	<i>ita mawak fɛn-t-it-e</i> I cow buy-PERF-1SG-PST 'I bought a cow'	<i>wota mawak fɛn-t-ot-e</i> we cow buy-PERF-1PL-PST 'We bought a cow'
2	<i>aana mawak fɛn-t-aj-e</i> you cow buy-PERF-2SG-PST 'You(s) bought a cow'	<i>jɛta mawak fɛn-t-ɛt-e</i> you cow buy-perf-2PL-PST 'You(pl) bought a cow'
3M	<i>noo mawak fɛn-t-e</i> he cow buy-PERF-PST 'He bought a cow'	<i>kɛta mawak fɛn-t-ɛk-e</i> they cow buy-PERF-3PL-PST 'They bought a cow'
3F	<i>naa mawakan fɛn-t-e</i> she cow buy-PERF-PST 'She bought a cow'	<i>kɛta mawak fɛn-t-ɛk-e</i> they cow buy-PERF-3PL-PST 'They bought a cow'

4.1.3. Number in nouns

Singular nouns in Aari is not marked for number. Plural is productively formed from the singular nouns by adding the morpheme {-na} as shown in the examples in Table-8:

Table-8: Number in Nouns

Gloss	SG	PL
'house'	eeha	eeha-na
'child'	jintsi	jintsi-na
'boy'	aɲins	aɲins-i-na
'bird'	afti	afti-na
'horse'	faras	faras-na
'lion'	zoob	zoob-na
'dog'	aaksi	aaksi-na
'rat'	uuntin	uuntini-na
'cow'	manwak	manwak-na
'woman'	maa/maana	maana-na

In *aɲins-i-na*, the vowel between the singular form and the plural marker {-na} is an epenthetic vowel inserted to avoid impermissible three consonant sequences.

It is important to note that plural interacts with definiteness in Aari. Most count nouns which are definite have {-na} even when they are not plural. For instance, *ets* refers to 'a man', *eed* 'man' collective form and *eedsi-na* 'the man'; *maa* 'woman' collective, *maana* 'a woman' and *maaji-na* 'the woman' (cf. *maana-na* 'women'). In fact this interaction has been noticed by Hyward 1990:442-445 as cited in Corbett, 2000:278).

It was found that nouns related to time exceptionally form their plural with {-bedi} as in *bon* 'year' versus *bon-bedi* 'years' and *sats* 'a day' versus *sats'a-bedi* 'years'.

4.1.4. Number in adjectives

Adjective like nouns add {-na} to show plural. The singular is not marked. Table-9 shows the singular and plural forms:

Table-9: Number in Adjectives

SG	Gloss	PL	Gloss
gaʒmi	'tall'	gaʒmi-na	'tall ones'
ts'edi	'short'	ts'edi-na	'short ones'
uuzmi	'beautiful'	uuzmi-na	'beautiful ones'
geɫta	'old'	geɫta-na	'old ones'

4.2. Numerals

Numerals categorically are nouns and sometimes behave like adjective because they are used to quantify a noun. There are two types of numerals: cardinal and ordinal; each of this is discussed below.

4.2.1. Cardinal numeral

Cardinal numerals are numbers used to count an entity, such as 1, 2, 3, etc. In Aari, cardinal numerals can be grouped into two based on their form: basic (simple) and divided (complex) as discussed below.

i) Simple basic numerals

Simple or basic numerals are the numbers from one to seven and number ten. The following are list of cardinal numerals representing 1-10:

1	wolɛɣa
2	kaskɛn
3	mɛkan
4	ojidi
5	doŋ
6	laa
7	tɛbaz
8	kaskɛn-tɛma-rs two- ten- for 'two more for ten'
9	wolɣan-tɛma-rs one –ten-for 'one more for ten'
10	tɛma

Number eight and nine are derived by mathematical operation, that is, by subtracting from ten. Thus, eight is combination of *kaskɛn* 'two' and *tɛma* 'ten' joined

with the affix {-rs} ‘for’, and number nine is the combination of *wolqan* ‘one’ and *təma* ‘ten’. Note that /q/ in *wolqan* becomes fricative between vowels as in *woləχa* ‘one’.

ii) Derived numeral

Cardinal numerals from eleven to nineteen are derived by combining *təma* ‘ten’ with other numerals of one to nine in the manner shown below:

11	<i>təma woləχo</i> ten-one	'eleven'
12	<i>təma kəsten</i> ten two	'twelve'
13	<i>təma məkən</i> ten three	'thirteen'
14	<i>təma ojidi</i> ten four	'fourteen'
19	<i>təma olχan təmers</i> ten one-ten-for	'nineteen'

The numerals from 11-20 are just combinations of ‘ten’ followed by the numerals ‘1-9’. Number 19 is complex, consisting of three words because number 9 itself is derived through computation (one more for ten).

Numerals from twenty to nine hundred ninety-nine have quite different ways of derivation process. The counting is done with the help of ‘human body’. Fingers of human body are used for counting the numerals. ‘Twenty,’ for example, refers to ‘one whole person’ or ‘a whole body’. This means that one person’s hands fingers and legs toes are counted together. So, *boonda* is ‘one full person’ implying ‘twenty’ since a healthy person- a person without disability in his fingers and toes has 10 fingers and 10 toes, total 20. The numbers 21-29 are based on *boonda* ‘twenty’. A few examples of the numbers 20-100 and the possible combinations to derive the number between 20 and 30, 30 and 40, etc. and their transliterations are given below:

20	<i>Boonda</i> full.person 'a full person'	'twenty'
21	<i>boonda-k woləχ</i> full.person-and one 'a full person and one'	'twenty-one'
29	<i>boonda-k wolχan təmε-rs</i> full.person-and one ten-for 'a full person and nine'	'twenty-nine'
30	<i>e-woləχ bab-its-ke afe-təma</i> full-one person- eat-and mouth-ten 'a full person eaten and a mouth to eat ten more'	'thirty'
31	<i>e-woləχ bab-its-ke afa-təma woləχa</i> full-one person-eat-and mouth-ten one	

38	'a full person eaten and a mouth to eat eleven more' <i>e-woleχ bab- its-ke afe-tema keskan teme-rs</i> full-one person-eat-and mouth-ten eight ten-for	'thirty-one'
40	'a full person eaten and a mouth to eat eight more' <i>e-χesten bab- its</i> full two person- eat	'thirty-eight'
42	'two full persons eaten' <i>e-χesten bab-its-ke afa-χesten</i> full- two person- eat-and mouth-two	'forty'
50	'two full persons eaten and a mouth ready to eat two' <i>e-χesten bab-its-ke afa-tema</i> full- two person- eat- and mouth-ten	'forty-two'
57	'two full persons eaten and a mouth ready to eat ten' <i>e-χesten bab-its-ke afe-tema tebza</i> full- two person-eat-and mouth-ten seven	'fifty'
60	'two full persons eaten and a mouth to eat seventeen' <i>e-merken bab-its</i> full-three person-eat	'fifty seven'
66	'three full persons eaten' <i>e-meken bab-itsi-ke afa-laa</i> full-three person-eat-and mouth-six	'sixty'
70	'three full persons eaten and a mouth to eat six' <i>e-meken bab-itsi-ke afa-tema</i> full-three persons-eat-and mouth-ten	'sixty-six'
73	'three full persons eaten and a mouth to eat ten' <i>e-meken bab-itsi-ke afa-tema mekan</i> full-three persons-eat-and mouth-ten three	'seventy'
77	'three full persons eaten and a mouth to eat thirteen' <i>e-meken bab-itsi-ke afa-tema tebza</i> full-three person-eat-and mouth-ten seven	'seventy-three'
80	'three full persons eaten and a mouth to eat seventeen' <i>(ed) ojidi bab-its</i> four person-eat	'seventy-seven'
90	'four (full) persons eaten' <i>ojidi bab-itsi-ke afa-tema-k</i> four person-eat-and mouth-ten with	'eighty'
99	'four persons eaten and a mouth left with eating ten' <i>ojidi bab-itsi-ke afa-tama wolχan-teme-rs</i> four person-eat-and mouth-ten one- ten-for	'ninety'
100	'four persons eaten and a mouth to eat nine' <i>doη bab-its</i> five person- eat	'ninety-nine'
101	'five persons eaten' <i>doη bab-itsi-ke afa-woleχa</i> five person- eat-and mouth- one	'hundred'

1000	'five persons eaten and a mouth to eat one <i>fije</i>	'hundred and one' 'thousand'
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The morpheme {-k(e)} is used as 'and' and {-ka} as 'with' in combining the numerals. As the speakers use 'as if they are eating the person' they are talking about, they use 'a person is eaten', such as 'a whole person is eaten and a mouth waiting to eat another P' where the P is the remaining person or entity to be eaten in addition, hence, representing the number added. Consider the following example:

e-meken bab-itsi-ke afa-laa
full-three person-eat-and mouth- six
three full persons being eaten and a mouth waiting to eat another six = '66'

This mathematically mean, 3 full persons x 20 (fingers and toes) plus 6 (entity that a mouth aspires to send it to the mouth to be eaten) which is equal to 66.

iii) Change of numeral patterns over time

With the introduction of Aari language to the school system, the derived numerals are simplified. One modification is the omission of the morpheme -k 'and' that was used to link the compound numerals. Consider the following:

The actual	The modified
boonda-k woleχ	boonda woleχ
full.person-and one	full.person one
'twenty-one'	'twenty-one'

Another change is the total omission of the concept of eating, and the body's action as in making the hand ready to feed the moth all together. This is found to be too complex for the students to learn. Thus, the simplified numeral representation is just combining the numerals 1-9 with numbers having the 10th values, such as 20, 30, 40 ... 100, etc. Compare the modified patterns in the examples below:

10	<i>tema</i>	ten	'ten'
20	<i>bonda</i>	twenty	'twenty'
21	<i>bonda woleχo</i>	twenty one	'twenty-one'
30	<i>mekan tema</i>	three ten	'thirty'
31	<i>mekan tema woleχo</i>	three ten one	'thirty-one'
40	<i>ojidi tema</i>		

	four ten	'forty'
50	<i>doη tema</i> five ten	'fifty'
60	<i>laa tema</i> six ten	'sixty'
70	<i>tebaz tema</i> seven ten	'seventy'
77	<i>tebaz tema tebaz</i> seven ten seven	'seventy-seven'
80	<i>kasken-tema-rs tema</i> two-ten-for ten (eight ten)	'eighty'
90	<i>wolχan-tema-rs tema</i> one -ten-for ten	'ninety'
100	<i>teman tema</i> ten ten	'hundred'
101	<i>teman tema woleχ</i> ten ten one	'hundred-one'

The new number system has also introduced the concept of zero (0), which is termed *guri* 'null'.

With the new pedagogical approach to numbers, the complex system of counting with body part is completely avoided. One has to simply follow syntactic order of the numbers to combine them. The numbers 1-7 and 10 are the simple un-combined forms. *Bonda* '20' is no more conceptualized as full persons, rather it is lexicalized like *tema* 'ten', so is simple. Number eight, nine and all numbers above 10, except 20, are then derived from ten by combinations. It is an opportunity for the kids who will learn with the simplified forms of the numbers in Aari, but it is demise to the heritage of the pre-existing number system as the children will completely forget them.

4.2.2 Ordinal Numeral

Ordinal numerals are expressed by adding a morpheme {-si} to the cardinal numerals. Number one does not take this morpheme rather it uses different lexical item *birena* 'first', which is different from the cardinal numeral *woleχa* 'one'. The cardinal numerals add the ordinal marking morpheme only from number two to number ten. It may be the case that the concept of ranking is made only up to ten. In case there is the need to rank above ten, the cardinal numerals play both the counting and ranking roles without change in form. The examples below show the derivation process:

Ordinal numeral	Gloss
<i>birena</i>	'first'
<i>kestim-si</i>	'second'
<i>mekim-si</i>	'third'
<i>ojit-si</i>	'forth'
<i>doη-si</i>	'fifth'

laa-si	‘sixth’
teṗ-si	‘seventh’
kaskan temer-si	‘eighth’
wolχen temer-si	‘ninth’
tem-si	‘tenth’
temawolχek	‘eleventh’
bonda	‘twentieth’

As can be seen from the examples, 11th and 20th do not take the ordinal marking morpheme. Ordinal numerals 12-19 are not in the example for they have the same form as the cardinal numerals.

4.3. Computation in Aari

Though Aari has its own conceptualization of numerals and systematic computation that largely depends on human body, mainly the mouth-hands and legs and the activity of human body, such as eating and being ready to eat, there is no symbol to represent the numerals. Thus, with the introduction of modern education into Ethiopia in general and Aari in particular, the people have learnt to use Arabic symbol to represent their numerals and to compute mathematical operations.

Key terms used for computation are: *guḏḏa* 'add', *zokfi* 'minus', *kafi* 'divide' and *batsi* 'multiply'. Let us consider a few examples of computations:

- i) a) *kasken-zen kasken guḏḏa-r sink?*
two-and two added-while how.much?
'How much is two plus two?'
- b) *jeka madda ojidi*
equal happen four
'It is equal to four'
- ii) a) *mekan tema-zen guri guḏḏa-r sink?*
three ten-and null added-while how.much?
'How much is thirty plus zero?'
- b) *jeka madda mekan tema*
equal happen three ten
'It is equal to thirty'
- iii) a) *tema woleχ-zen bonda woleχ (guḏḏa-r sink?)*
ten one-and twenty one (added-while how.much?)
'How much is eleven plus twenty-one?'
- b) *jeka madda mekan tema kasken*
equal happen three ten two
'It is equal to thirty-two'
- iv) a) *ojida-zank kasken zokfa-r sink?*
four from two minus-while how.much
'How much is four minus two'
- b) *jeka madda kasken*
equal happen two

- 'It is two'
- v) a) *ojida kasken-kan kafa-r sink?*
four two to divide-while how.much
'How much is four divided by two?'
- b) *jeka madda kasken*
equal happen two
'It is equal to two'
- vi) a) *ojida kasken-k batsa-r sink?*
four two-by multiply-while how.much
'How much is four multiply by two?'
- b) *jeka madda kasken-tema-rs*
equal happen two ten-for
'It is equal to eight'

Note that the postpositions affixed to numbers in operation are *zen* 'and' or 'plus'; *zank* 'from'; *kan* 'to' ; {-k} 'by' and {-rs} 'for'. The morpheme {-r } attached to the verbs such as add, subtract, divide and multiply has the sense of 'while' or 'when'.

5. Summary and Discussion

5.1 Summary

Number in Aari is expressed in pronouns, nouns, adjectives and verbs as an agreement. In pronouns, singular and plural is distinguished in first, second and third persons. The person marks in nominative pronouns are formally different in all the three people's singular and plural forms. The same holds true for possessive pronouns. In demonstrative pronouns, close reference singular is distinguished from plural with vowel length where the former has short and the latter long vowel, respectively. In far reference, the plural form adds {-kes} to the singular form. This morpheme is mainly marker of plural in north Aari, but in this case introduced to South Aari dialect. In isolative pronoun *woləxa* 'number one' and plural forms of object pronouns 'us', 'you' and 'them' are used. In inclusive pronouns, plural forms of subject pronouns and *muudena* 'all' are used to express inclusion of everyone. Exclusion of everyone is expressed with negative prefix *aaj-*, followed by plural forms of pronouns and *tere* that marks a focus. Number in verbs is expressed with shortened forms of singular and plural pronominal affixes that mark agreement of a verb with its subject and objects. Singular in nouns and adjective is not marked, but the plural is shown with {-na} in both categories.

Numerals have been discussed following the established approach as cardinal and ordinal. Cardinal numerals in Aari are simple and derived. The simple numerals are those lists from 1-7 number ten, and twenty. Others are relatively derived. Number eight and nine are derived by subtracting two and one from ten, respectively. Numerals from 11 are derived by adding the numerals one to nine to 10; numeral 21-29 are derived by adding numerals one to nine to twenty, and so on. Note that numeral 20 and above are traditionally counted using body parts, such as *bonda* 'whole body' which is twenty implying that all toes and fingers of a person are counted. The number system has been

recently changed for pedagogical reasons. It seems that the concept of counting with body parts is avoided considering its complexity. Ordinal numeral is marked with {- (im)si} added to the cardinal numerals. It is found that this morpheme is added to numbers 2 to 9 only. For someone or something first, Aari uses *birena* 'first' which is different from *woləxa* 'one'. Terms used for mathematical computation in the language are: *gudza* 'plus', *zokfi* 'minus', *kafi* 'divide' and *batsi* 'multiply'. The concept of zero is expressed with *guri* 'null'.

5.2 Discussion

The present finding with regard to singular nouns, which is not morphologically shown, conforms to the Daniel (1993) and Fekede (20110) findings. As to the plural marking, it differs with Daniel (1993) who claims that plural nouns end in {-a} but conforms to Fekede (2011) who states the plural in South Aari dialects, such as Sido and Baka is marked with {-na}, which is augmented with *-kes*; hence, becomes {-nakes} in the northern Aari dialects, such as Gayil. With regard to the counting system and ordinal numeral derivation, the present finding is partly similar to the Fekede (2011) findings. However, the present finding also differs in this regard as the counting system is significantly modified for pedagogical reason since 2016. The computation system has not been described in the previous studies since it was introduced only recently with the launch of mother tongue education program in 2016.

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